REMARKS

The Applicant requests reconsideration of the rejection. Claims 1-15 remain pending.

Claims 1-2, 5-7, 10-12, and 15 were rejected under 35 U.S.C. 102(e) as being anticipated by Meehan et al., U.S. 2004/0177218 (Meehan). The rejection relies on Patterson et al., "A Case for Redundant Arrays of Inexpensive Disks (RAID)" and Massiglia, "The RAIDbook" to support the rejection, the Office Action asserting that these documents are incorporated by reference in Paragraph 5 of Meehan.

Respectfully, the rejection fails on its face to be proper under 102(e), which requires each and every limitation in the rejected claims to be disclosed explicitly or inherently in the publication itself. In paragraph 5, Meehan indeed refers to the Patterson and Massiglia publications as disclosing several configurations for redundant arrays of independent disks. However, Meehan does not incorporate the subject matter of either publication by reference, and thus cannot be said to incorporate their subject matter in Meehan's teachings. Therefore, the Applicant requests reconsideration and withdrawal of the rejection.

In addition, the Applicant notes certain differences between the claimed invention and the disclosure of Meehan. In particular, the storage unit of independent Claim 1 comprises a first receiving unit that receives copies of first storage data from other storage units. A first operation controller calculates an exclusive OR of the copies of the first storage data, and a first storage controller stores the calculation result of the exclusive OR into second hard disk drives of the storage unit.

The Office Action relies on Fig. 5 of Meehan as disclosing the claimed storage unit at 320 (including Level 3 RAID Controller (1) 320 (which allegedly may be operated as a Level 4/5 RAID Controller) and associated Disks 1, 2); the first receiving unit as the Level 3 RAID Controller (1) 320; the first operation controller as the Level 3 RAID Controller (1) 320; and the first storage controller as Level RAID Controller 330. However, the RAID Controller 320 is not disclosed to perform all of the functions required to be performed by the claimed first receiving unit and first operation controller.

Specifically, the Office Action states that the RAID Controller 320 calculates an exclusive OR of the copies of the first storage data. However, what Meehan's Fig. 5 illustrates

is a block diagram of a RAID architecture in which many RAID levels, each cascaded into the next, may be used. The RAID controllers 320 and 330 are not discussed in detail, except to say that at the fourth level one of the nodes is a RAID Controller (presumably RAID Controller 330) while the other nodes are storage devices. The fourth level RAID controller could implement a RAID 0 stripe or other RAID implementation to the storage devices at the fifth level 340. The publication never discloses or even suggests that RAID controller 320 calculates an exclusive OR of copies of first storage data, whether received therefrom or from any unit corresponding to the claimed "first receiving unit".

One may attempt to infer that Meehan's secondary RAID Controller (1) 310 is similar to RAID Controller 320. However, attempting to make this comparison, one sees that the primary RAID Controller 305 could implement a RAID 4/5 parity and RAID 0 stripe to the secondary RAID Controllers 310 which could then implement a RAID 0 stripe or other RAID implementation to the next lower level (e.g., RAID Controller 320). Further, according to the publication, each RAID Controller (primary and/or secondary) may implement the RAID level calculations/operations in hardware (e.g., using a hardware XOR with or without instruction sets) or software

(e.g., using a central processing unit executing dedicated software to calculate, for example, RAID 4/5 parity and generate the RAID stripe). See [0017] on Page 2 of the publication. At no point does Meehan disclose that any of the RAID Controllers implements the operations or processing of the claimed first operation controller which calculates an exclusive OR of the copies of the first storage data, or the first storage controller which stores the calculation result of the exclusive OR into storage blocks of second hard disk drives.

In addition, the disclosures of Patterson and Massiglia do not have the teachings missing from Meehan. The Office Action notes Patterson's disclosure of a RAID-4 parity generation in which each parity bit is a single exclusive OR of all corresponding data bits in a group. However, the passage of Patterson states, more specifically, that the calculation of an exclusive OR is performed to generate new parity by calculating an exclusive OR based on old parity, old data, and new data:

new parity = old data XOR new data XOR old parity

Patterson's calculation of new parity thus does not correspond to the required calculation of an exclusive OR of the copies

of the first storage data received from other storage units. Massiglia is not seen to provide these teachings, either.

Indeed, it does not seem as though the multiple RAID architecture taught by Meehan (whether taken individually or in combination with the teachings of Patterson and Massiglia is directed to the same kind of recovery-storage scheme as that to which the present invention is directed. In this regard, it is instructive to remember that the disclosed invention broadly includes a storage unit 4 (600: e.g., Fig. 1) as a back-up storage unit containing the calculation result of the exclusive OR of the data stored in the storage areas of storage units 1-3 (600). When it is required to store data stored in the storage area of failed storage unit 1 (for example), the data stored in the storage areas of 2-4 (other than storage unit 1) is exclusively ORed to restore the data stored in the storage area of storage unit 1. This may be expressed as follows: Let D1 be data stored in storage unit 1, D2 be data stored in storage unit 2, and D3 be data stored in storage unit 3. Then, D4 which is data stored in storage unit 4, is expressed as

D1 (EXOR) D2 (EXOR) D3,

where "EXOR" is an operator representing the exclusive OR operation. To restore D1, the operation D4 (EXOR) D2 (EXOR)

D3 is performed. This operation restores D1. In this way, data stored in the storage areas of the storage units 600 can be backed up in this embodiment, no matter how many other storage units 600 are connected communicably to the backup storage unit 4.

While it is noted that not all of the details of the exemplary disclosed embodiment discussed above are set forth in independent Claim 1, independent Claim 1 is limited by a first receiving unit that receives copies of first storage data and first identifiers from other storage units, a first operation controller that calculates the exclusive OR of the first copies of the first storage data, and a first storage controller that stores the calculation result of the exclusive OR into storage blocks of second hard disk drives. This storage unit is not taught by Meehan, whether taken individually or in combination with Patterson or Massiglia.

Similarly, the storage system set forth in Claim 1 is not disclosed by the disclosures cited in the Office Action. In particular, the storage system claimed in Claim 11 comprises a plurality of first storage units and a second storage unit connected communicably to the first storage units. The second storage unit comprises a first data receiving unit that receives copies of first storage data from the first storage

units. A first data operation controller calculates an exclusive OR of the copies of the first storage data, and a first data storage controller stores the calculation result of the exclusive OR, calculated by the first data operation, into storage blocks of second hard disk drives of the second storage unit.

Similarly, the method recited in Claim 6, of controlling a storage unit connected communicably to a plurality of other storage units, is patentable as requiring the steps of receiving copies of first storage data from the other storage units, calculating an exclusive OR of the copies of the first storage data, and storing the calculation result of the exclusive OR into storage blocks of second hard disk drives.

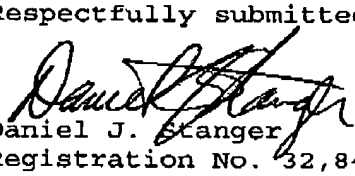
Inherently, the dependent Claims 2-5, 7-10 and 12-15 contain all of the patentable limitations of their respected independent claims. Accordingly, the patentability of these dependent claims is evident without addressing their separately patentable limitations. To expedite the allowance of the application, and for the brevity of this paper, the Applicant does not discuss further the separate patentability of the dependent claims at this time.

Claims 3-4, 8-9 and 13-14 were rejected under 35 U.S.C. 103 as being obvious over Meehan, Patterson, Massiglia , and

Kawamoto et al., U.S. 2003/0220985 (Kawamoto). These claims also inherit the patentable features of their independent claims and, because Kawamoto does not supply the teachings missing from Meehan, Patterson, and Massiglia, are patentable for the same reasons advanced above.

In view of the foregoing remarks, the Applicant requests reconsideration of the rejection and allowance of the claims.

Respectfully submitted,



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